

American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK 24, N.Y.

NUMBER 2221

AUGUST 17, 1965

The Spiders of the Genus *Islandiana* (Linyphiidae, Erigoninae)

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The present paper is concerned with the small, sheet-web weavers of the genus *Islandiana*, a group previously known only from four species. As here revised on the basis of much new material, the genus now comprises 13 species, of which eight are new and one is transferred from another genus.

In 1936, Crosby and Bishop proposed the generic name *Aduva* for what then appeared to them to be three species from North America. However, Braendegaard (1932) had already used another name, *Islandiana*, for a new species, *princeps*, from Iceland, which belongs to the group, and this generic name has priority. Actually, *princeps* is also widespread across North America and was studied by Crosby and Bishop, who confused it with *alata* and a third species here given the name *holmi*. In 1935, Chamberlin and Ivie described *Oedothorax lasalanus*, which now proves to belong to *Islandiana* and brings the total number of previously named species to five.

Among the more bizarre forms of *Islandiana* are four new species taken from American caves. These cave species are pale in color, with eyes either degenerate or absent and with longer legs than those of species living on the outside.

The only species known to occur outside North America are *princeps* and *alata*, which are reported from Iceland and northern Sweden, respec-

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tively. No specimens of this genus have yet been taken south of the United States.

This paper is based in large part on the collection of the American Museum of Natural History, where all types of new species and other specimens not indicated as belonging elsewhere are now deposited. I am much indebted to Dr. Willis J. Gertsch, under whose supervision the work was carried out. I am also grateful to the following for the loan of specimens and cooperation in this study: Dr. Herbert Levi of the Museum of Comparative Zoölogy, Harvard University; Dr. R. V. Chamberlin, University of Utah; Dr. Henry Dietrich, Cornell University; and Dr. Harriet Frizzell, Rolla, Missouri.

This work was made possible and was done as a phase of a project supported by a grant from the National Science Foundation (G-24384).

GENUS *ISLANDIANA* BRAENDEGAARD

Islandiana BRAENDEGAARD, 1932, pp. 20–25 (type, *princeps*, new species); 1937, pp. 12–13; 1940, p. 21; 1946, pp. 50–51; 1958, p. 67. JACKSON, 1934, pp. 61, 614. KASTON, 1938, p. 180; 1948, pp. 205–206; 1955, p. 167. ROEWER, 1942, p. 729. HOLM, 1945, pp. 5, 21–25; 1950, pp. 108, ff.; 1960, p. 121. RAPP, 1946, p. 318. CHAMBERLIN AND IVIE, 1947, p. 45. LEVI AND LEVI, 1951, p. 222; 1955, p. 36. HACKMAN, 1954, p. 58. LOWRIE AND GERTSCH, 1955, p. 6. BONNET, 1957, pp. 2310–2311. WHITCOMB AND BELL, 1964, p. 43.

Aduva BISHOP AND CROSBY, 1936, pp. 39–42 (type, *Tmeticus longisetosus* Emerton). ROEWER, 1942, pp. 632, 633.

Tmeticus (in part): EMERTON, 1882, p. 54 (*T. longisetosus*, new species). BANKS, 1892, p. 39 (*T. flaveolus*, new species); 1895, p. 424; 1896, p. 191; 1916, p. 74. BRYANT, 1908, p. 33. EMERTON, 1909, pp. 192–193; 1919, p. 3H (*T. alatus*, new species). BARROWS, 1918, p. 305.

Gongylidium (in part): SIMON, 1884, p. 500. BANKS, 1910, p. 30 (*Gongylidium*). EMERTON, 1920, p. 315.

Erigone (in part): MARX, 1890, p. 534.

Oedothorax (in part): CROSBY, 1905, p. 311. PETRUNKEVITCH, 1911, pp. 262, 263. CROSBY AND BISHOP, 1928, p. 1050. SMITH, 1928, p. 488. CHAMBERLIN AND IVIE, 1935, p. 18 (*O. lasalanus*, new species).

Gongylidiellum (in part): HOLM, 1939, pp. 23–25 (*G. flavum*, new species).

Tapinocyba (in part): CHAMBERLIN, 1948, p. 552 (*T. iowa*, new species).

Islandiana, a genus of small linyphiid spiders, belongs to the group Eri-goneae in the subfamily Erigoninae. It is closely related to *Collinsia* O. P.-Cambridge and *Scotargus* Simon, being readily and most discretely separated from them by the enlarged setae on the paracymbium of the male palpus. Otherwise, the structure is quite generalized, without special modifications (except in four cave species having much reduced eyes and *unicornis*, one of the cave species, having also a peculiar enlarged setae on the head of the male).

Members of this genus range across the northern part of North America, extending into the southern United States; they are also known from Greenland, Iceland, and northern Scandinavia. These spiders are found living on the ground, often under stones, or in caves.

COLORATION AND STRUCTURE: Color varying from very light yellowish to nearly black, usually pale, but with tendency toward melanism in several species, particularly in *flaveola* and *princeps*. "Typical" color pattern as follows: Carapace light yellowish amber, without markings; eyes ringed with black. Chelicerae a little darker than carapace and more reddish. Sternum and labium more or less shaded with dusky. Legs, palpi, and spinnerets yellowish amber, without markings; certain parts of male palpus darker. Abdomen pale gray or yellowish gray, without markings or pattern. In darker specimens, cephalothorax and appendages in some cases shaded; carapace with radial streaks, a "shield" and other dusky markings characteristic of the Erigoninae; sternum and abdomen dark gray or black. A general similarity in color prevails among the various species.

Size varying from about 1.25 mm. to 2.50 mm. in length, with *cavealis* and *alata* being the largest and *flaveola* the smallest. General build moderately slender. Legs moderately long; fourth tibia-patella about same length as carapace, except legs of cave species proportionately longer.

Carapace subovoid, width about three-fourths of length; as seen from above, rounded across front, without cervical indentations, inconspicuously truncate behind; more ovoid and rounded in male, with head shorter and narrower. Head not peculiarly elevated or otherwise modified in male (except in *unicornis*). Clypeus nearly vertical, slightly protruding at margin. Carapace without cervical depressions and without a median groove.

Eyes, when present, of usual form, size, and arrangement for subfamily. Anterior median eyes smaller than others. Eye rows nearly straight; posterior eyes two-thirds to one diameter apart; anterior median eyes about a radius apart, usually slightly farther from lateral eyes. Eyes of male a little closer together than those of female. In cave-adapted species, eyes absent or degenerate.

Sternum large, a little longer than wide, with posterior extension separating hind coxae by about one of their diameters. Labium much wider than long, fused to sternum. Endites normal, somewhat convergent around labium, well separated at tips.

Chelicerae essentially vertical, length less than combined width. In some cases with fixed spur mesially in front in male. Fine stridulating file present on ectal side, in both sexes. Fang groove with four or five teeth

in front, three or four small denticles behind.

Legs unmodified, of moderate length and robustness; IV, I, II, III in order of length. Tibiae I, II, and III with two dorsal spines, tibia IV with one. Spine on tibia IV about 0.25 distance from base. Trichobothrium on metatarsus I near center of length; metatarsus IV without trichobothrium. Metatarsus I distinctly longer than tarsus.

Epigyna varied; typically protruding like small cone but in some cases quite flattened; with a posterior median plate of shape varying with species. Openings usually not exposed on ventral surface.

Palpus of male with femur and patella slender, unmodified. Tibia short and broadly expanded distally; usually with a short dorsal process. Cymbium simple, short, rounded. Paracymbium distinctively developed, thick, notched, and recurved ventrally, with slender dorsad extension over edge of cymbium bearing one, two, or three large setae, these in some cases much elongated and more or less serrated, extending forward and ventrad over ectal side of palpus.

Females separated most readily by structure of epigynum and secondarily by differences in size. Males readily separated by structure of palpus; species usually identifiable from shape of tibia of palpus as seen from above.

KEY TO SPECIES

- | | |
|--|--------------------|
| 1. Males | 2 |
| Females | 12 |
| 2. Paracymbium of palpus bearing three enlarged setae | 3 |
| Paracymbium bearing one or two enlarged setae | 7 |
| 3. Length about 1.5 mm. | 4 |
| Length distinctly more than 1.5 mm. | 6 |
| 4. Eyes normal | 5 |
| Eyes absent or nearly so; palpus with bifurcate "hook" on tibia (fig. 49) | |
| | <i>muma</i> |
| 5. Terminal division of palpus as shown in figure 3 | <i>princeps</i> |
| Terminal division of palpus as shown in figure 7 | <i>coconino</i> |
| 6. Tibia of palpus with distinct "spur" on mesial margin, as seen from above (fig. 17) | <i>alata</i> |
| Tibia of palpus with "spur" on mesial margin very weak, as seen from above (fig. 12) | <i>holmi</i> |
| 7. Largest seta on paracymbium about half of length of cymbium | 8 |
| Largest seta on paracymbium much more than half of length of cymbium . | 10 |
| 8. Two enlarged setae nearly equal in size | 9 |
| Two enlarged setae very unequal in size (fig. 22) | <i>flaveola</i> |
| 9. Chelicerae without a distinct spur in front | <i>mimbres</i> |
| Chelicerae with a distinct spur in front | <i>flavoides</i> |
| 10. Paracymbium bearing two very large setae of about equal size (fig. 33) | <i>longisetosa</i> |

- Paracymbium with one seta much stouter than the others 11
11. Eyes normal *lasalana*
 Eyes degenerate *unicornis*
12. Eyes normal 13
 Eyes degenerate or absent 20
13. Median posterior sclerite of epigynum longer than wide 14
 Median posterior sclerite of epigynum wider than long 17
14. Length 2.0 mm. or more 15
 Length less than 2.0 mm. 16
15. Median posterior sclerite of epigynum narrower (fig. 20) *alata*
 Median posterior sclerite of epigynum wider (fig. 14) *holmi*
16. Median posterior sclerite of epigynum narrowed at apex (fig. 5) *princeps*
 Median posterior sclerite of epigynum wide at apex (fig. 10) *coconino*
17. Length less than 1.5 mm. *flaveola*
 Length more than 1.5 mm. 18
18. Median posterior sclerite of epigynum only slightly wider than long .. *flavoides*
 Median posterior sclerite of epigynum much wider than long 19
19. Median posterior sclerite of epigynum strongly exposed in ventral view (fig. 38); lateral ends of sclerite pointed (fig. 39) *lasalana*
 Median posterior sclerite of epigynum only slightly exposed, if at all, ventral view (fig. 34); lateral ends of sclerite rounded (fig. 35) *longisetosa*
20. Length more than 2.0 mm. (caves of Kentucky) *cavealis*
 Length less than 2.0 mm. 21
21. Epigynum with openings in grooves extending onto ventral surface (fig 46) *muma*
 Epigynum with openings under posterior rim, not in grooves 22
22. Epigynum with posterior sclerite wider than long (fig. 40) (caves of northern Texas) *unicornis*
 Epigynum with posterior sclerite about as long as wide (fig. 53) (cave of West Virginia) *speophila*

Islandiana princeps Braendegaard

Figures 1-6

Islandiana princeps BRAENDEGAARD, 1932, pp. 22-25, figs. 6-8. JACKSON, 1934, pp. 611, 614. ROEWER, 1942, p. 729. HOLM, 1945, pp. 22-25, figs. 5e, 5f. BRAENDEGAARD, 1946, pp. 50-51; 1958, p. 67, figs. 62, 63a.

Aduva alata: BISHOP AND CROSBY, 1936 (in part), pp. 39-40, figs. 1-3.

Islandiana alata: BRAENDEGAARD, 1937 (in part), p. 12; 1940, p. 21. HACKMAN, 1954, pp. 6, 34, 35, 58. BONNET, 1957, p. 2310.

DIAGNOSIS: Closely related to *alata*, *holmi*, and *coconino*. Smaller than *alata* and *holmi* (see measurements below). Distinguishable from all three by differences in palpus and epigynum (see figures).

DESCRIPTION: Color typically light yellowish, but subject to varying degrees of melanism. In lighter specimens, cephalothorax, appendages, and spinnerets light amber, with chelicerae darker and more reddish; sternum and labium lightly shaded with dusky; certain organs of male

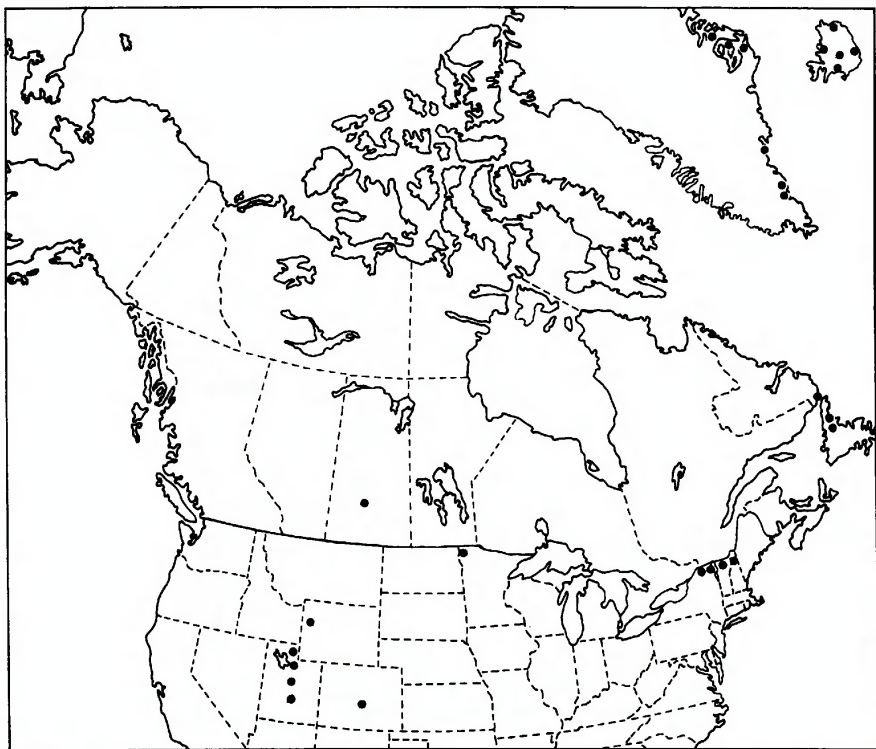


FIG. 1. Map showing distribution of *Islandiana princeps* Braendegaard.

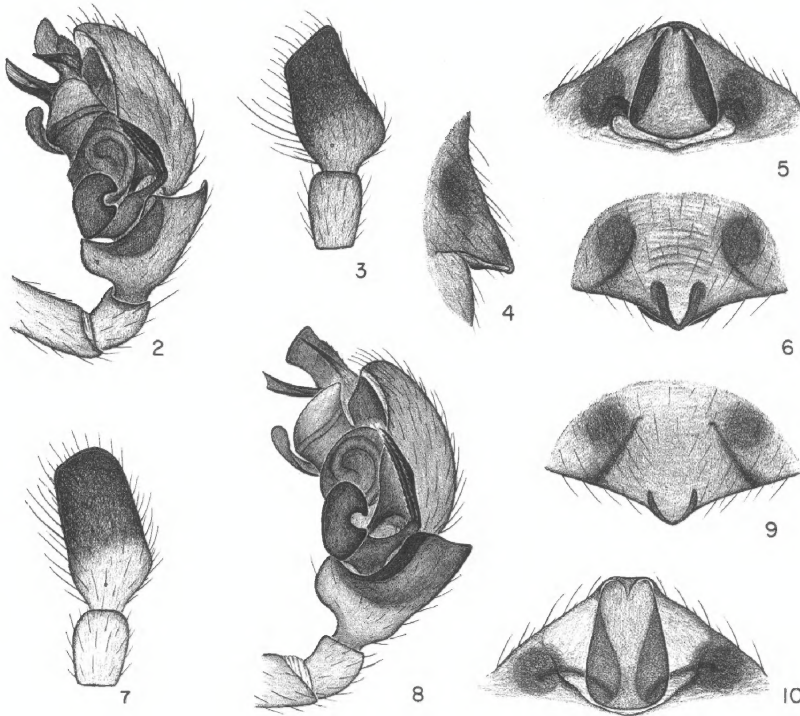
palpus darker; abdomen pale gray. In darker specimens, carapace and appendages shaded, carapace tending to be marked with dark pattern; sternum and labium more or less blackened; abdomen dark gray to black.

Structure generalized, without special modifications. Paracymbium of male palpus with three enlarged, serrate setae of moderate length (fig. 2). Chelicera of male without fixed spur in front. Eyes typical for the genus, although a little larger than average. Epigynum protruding ventro-caudad as small cone (fig. 4). Size small; sexes similar in size and general structure. Length of male, 1.5 mm.; carapace, 0.75 mm. long, 0.55 mm. wide; tibia-patella I, 0.62 mm., IV, 0.7 mm. Length of female, 1.7 mm.; carapace, 0.75 mm. long, 0.55 mm. wide; tibia-patella I, 0.63 mm., IV, 0.75 mm.

DISTRIBUTION: Iceland, Greenland, Canada, and northern United States, extending southward to latitude 38° N. in the Rocky Mountain region.

TYPE DATA: Male holotype and male and female paratypes from Akureyri, Iceland, longitude 18° 10' W., latitude 65° 44' N., August 12, 1929 (Carl H. Lindroth), Göteborg Museum, Sweden.

LOCALITY RECORDS: *Iceland*: For list of localities and specimens, see Braendegaard (1958). *Greenland*: Jameson Land, August, 1933 (David



FIGS. 2-6. *Islandiana princeps* Braendegaard. 2. Left palpus, ectal view. 3. Tibia and patella of left palpus, dorsal view. 4. Epigynum, lateral view. 5. Epigynum, posterior view. 6. Epigynum, ventral view.

FIGS. 7-10. *Islandiana coconino*, new species. 7. Tibia and patella of left palpus, dorsal view. 8. Left palpus, ectal view. 9. Epigynum, ventral view. 10. Epigynum, posterior view.

Lack), Jackson, 1934; Fulach Dal at Dickson Fjord, August 9, 1934, one female; Cape Stosch, Franz Joseph Fjord area, July 18, 1933 (Sogaard Anderson), one female, Braendegaard (1940), Göteborg Museum. Angmagssalik, August 9, 1932, one female; Umanak, Griffenfeld Island, July 25, 1932, one female; Cape Tordenskjold, August 21, 1932, one female (Richard Boegvad), Braendegaard, 1937, presumably in Göteborg Museum. *Labrador*: Grady Island, August 20, 1928 (O. L. Austin, Jr.), one

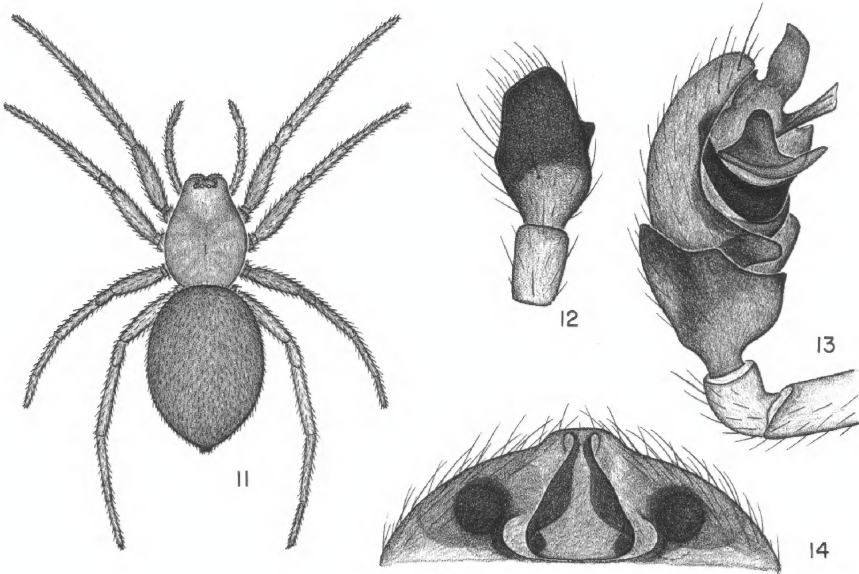
female, Museum of Comparative Zoölogy. *Newfoundland*: Serpentine Mountains, 2000 feet elevation, July 17, 1949, three males and one female; Daniels Harbour, July 22, 1949, 10 females (Ernest Palmen), both from Hackman, 1954. *Saskatchewan*: Saskatoon, June 3, 1920, one male, Bishop and Crosby, 1936. *New Hampshire*: Mount Washington, June 1, 1920 (Nathan Banks), three males, two females, Bishop and Crosby, 1936, Museum of Comparative Zoölogy. *Vermont*: Mount Mansfield, June 14, 1927 (C. R. Crosby), three males and one female, Bishop and Crosby, 1936, Cornell University; June 17, 1909 (J. H. Emerton), one male, Museum of Comparative Zoölogy. *New York*: John's Brook, Mt. Marcy, August 25, 1930, one male; Mt. MacIntyre, June 25, 1925 (C. R. Crosby), two males and six females, Bishop and Crosby, 1936, Cornell University. *Minnesota*: Eight miles southeast of Warren, June 12, 1945 (Wilton Ivie), one female. *Colorado*: Pikes Peak, July 30, 1941 (Clarence and Marie Goodnight), one female. *Wyoming*: Lake Solitude, Grand Teton National Park, July 16, 1950 (D. C. Lowrie), one female. *Utah*: Fish Lake, September 4, 1929 (W. J. Gertsch), one male. Three miles west of Santaquin, June 6, 1934 (Wilton Ivie), one male. Utah Lake at mouth of Provo River, June 25, 1941 (Wilton Ivie), one male. East shore of Bear Lake, June 26, 1962 (Wilton Ivie), one male and two females.

***Islandiana coconino*, new species**

Figures 7-10

DIAGNOSIS: Closely related to *princeps*, resembling it in size, color, and general features, but differing in details of genitalia and eyes.

DESCRIPTION: Color of cephalothorax, appendages, and spinnerets light amber; chelicerae more reddish, sternum and labium shaded with dusky, palpal organs of male darker. Abdomen light gray. Structure of male holotype essentially typical, size medium for the genus. Height of clypeus a little more than two diameters of anterior lateral eye. Eye area occupying nearly two-thirds of width of head; eyes typical. Posterior eye row straight, median eyes 0.9 diameter apart, 0.8 diameter from lateral eyes. Anterior eye row straight, median eyes 0.4 diameter apart, 0.5 diameter from lateral eyes. Chelicerae without fixed spur in front; stridulating file much reduced. Palpus resembling that of *princeps*, differing in details (see figs. 7 and 8). Paracymbium with three enlarged setae which extend about halfway to tip of cymbium (fig. 8). Length, 1.5 mm.; carapace, 0.75 mm. long, 0.52 mm. wide; tibia-patella I, 0.7 mm., IV, 0.75 mm. Female allotype essentially typical in structure. Eyes slightly smaller than average for genus. Eye area occupying less than two-thirds of width of head. Posterior eye row straight, median eyes one diameter apart, same



FIGS. 11-14. *Islandiana holmi*, new species. 11. Female, dorsal view. 12. Tibia and patella of left palpus, dorsal view. 13. Left palpus, mesial view. 14. Epigynum, posterior view.

distance from lateral eyes. Anterior eye row straight, median eyes 0.6 diameter apart, 0.7 diameter from lateral eyes, more than a diameter from posterior lateral eyes. Epigynum conical, protruding (fig. 9); posterior median sclerite widened distally (fig. 10). Length, 1.75 mm.; carapace, 0.75 mm. long, 0.55 mm. wide; tibia-patella I, 0.7 mm.; IV, 0.75 mm.

TYPE DATA: Male holotype, female allotype, and female paratype from North Rim, Grand Canyon, Arizona, longitude 112° 07' W., latitude 36° 24' N., June 15, 1934 (Wilton Ivie).

OTHER LOCALITY: Colorado: Grand Mesa, July 26, 1941 (C. and M. Goodnight), one female.

The name is a noun in apposition, taken from the name of the county where the species was collected.

***Islandiana holmi*, new species**

Figures 11-14

Aduva alata: BISHOP AND CROSBY, 1936 (in part), pp. 39-40.

Islandiana alata: LEVI AND LEVI, 1951, p. 222; 1955, p. 36. LOWRIE AND GERTSCH, 1955, p. 6. (Not *Tmeticus alatus* Emerton.)

DIAGNOSIS: A large species closely related to *alata*, differing mainly in details of palpus and epigynum. Tibia of male palpus lacking the distinct projection seen on the mesial border of *alata* as viewed from above (fig. 12). Median sclerite of epigynum, as seen in posterior view, wider than in *alata*. Also resembling *princeps*, but distinctly larger and exhibiting genitalic differences.

DESCRIPTION: Color of cephalothorax and appendages light amber, more or less shaded with dusky; interocular area blackish; sternum and labium in some cases heavily shaded. Abdomen varying from light gray to dark gray in different specimens.

Structure generalized, without special modifications. Eyes slightly smaller than usual. Eye area occupying a little more than half of width of head at posterior eye row. Height of clypeus 2.5 diameters of anterior lateral eye. Eye relationships typical. Length of male holotype, 1.8 mm.; carapace, 0.82 mm. long, 0.63 mm. wide; tibia-patella I, 0.75 mm., IV, 0.8 mm. Length of female allotype, 2.0 mm.; carapace, 0.85 mm. long, 0.65 mm. wide; tibia-patella I, 0.78 mm., IV, 0.83 mm.

DISTRIBUTION: Rocky Mountains of the United States and mountains of northern New York State (fig. 15).

TYPE DATA: Male holotype, female allotype, and female paratype from summit of Mt. Washburn, Yellowstone National Park, Wyoming, August 13, 1940 (Wilton Ivie). Named in honor of Åke Holm, Sweden.

LOCALITY RECORDS: *New York*: Mount Marcy, August 26, 1930 (C. R. Crosby), five males and four females, Bishop and Crosby (1936), Cornell University. *Colorado*: Pikes Peak, 11,600 feet elevation, June 22, 1940 (Wilton Ivie), one male and one female. Summit Lake, near Mt. Evans, August 17, 1952 (B. Malkin and V. E. Thatcher), two females. Copeland Mountain, 13,000 feet elevation, August 10, 1926 (H. H. Cleaves), one male, Bishop and Crosby (1936), Cornell University. Cameron Pass, 11,000 feet elevation, August 3, 1946 (C. C. Hoff), two females. Milner Pass, Rocky Mountain National Park, July 8, 1949 (W. J. and J. W. Gertsch), one female. *Wyoming*: Big Horn Mountains, July 3, 1933 (C. R. Crosby), one male and four females, Bishop and Crosby (1936), Cornell University. Togwatee Pass, July 8, 1950 (D. C. Lowrie), one male, Lowrie and Gertsch (1955). Uhl Hill, Grand Teton National Park, reported by Levi and Levi (1951). *Montana*: Swiftcurrent Mountain, 8000 feet elevation, Glacier National Park, 1955 (L. R. and H. W. Levi), reported by Levi and Levi (1955).

DISCUSSION: This species tends to occur on the high mountains of the United States in much the same range with *I. princeps*, with which it has previously been confused under the name *alata*. Authentic specimens of

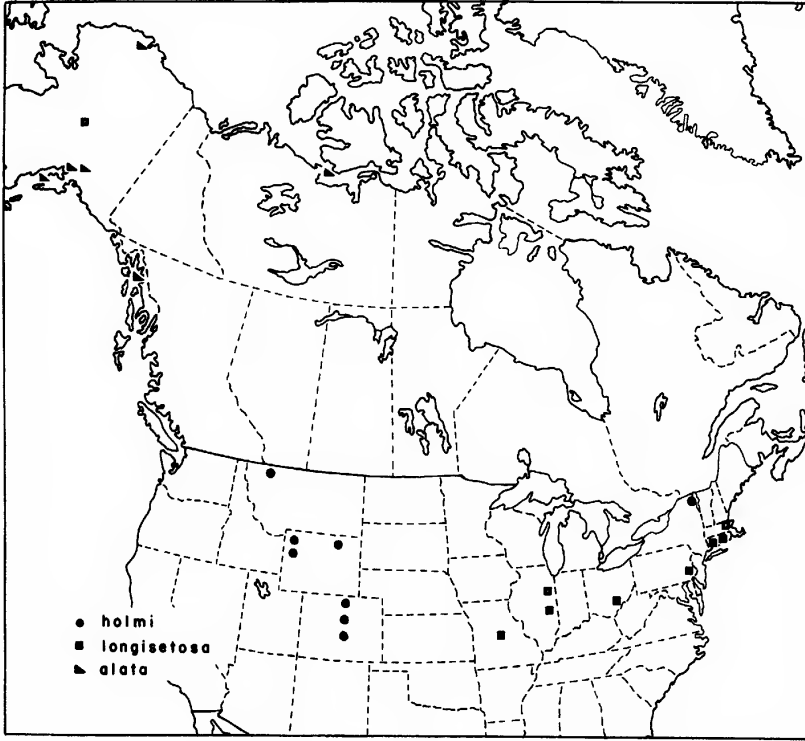


FIG. 15. Map showing distribution of *Islandiana holmi*, new species, *longisetosa* (Emerton), and *alata* (Emerton).

alata are not known from the United States mainland, being known only from Alaska, northern Canada, and Sweden. Little is known of the habits of this species, except that it is usually found on the ground under rocks.

Islandiana alata (Emerton)

Figures 16–21

Tmetiscus alatus EMERTON, 1919, p. 3H, figs. 5–7.

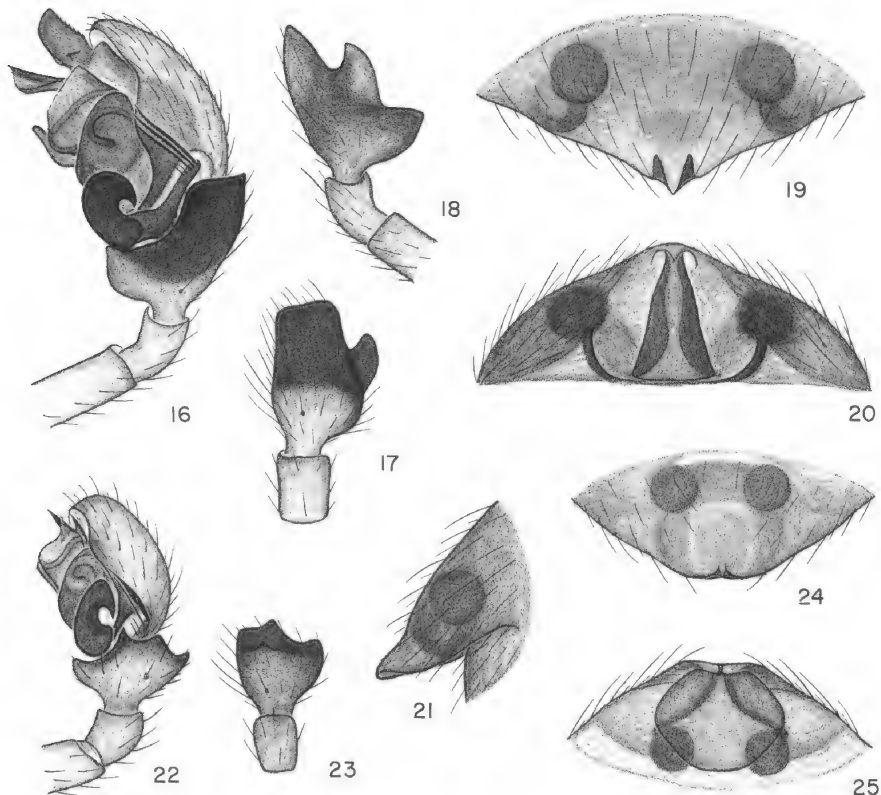
Gonglydium alatus (sic): EMERTON, 1920, p. 315.

Aduva alata: BISHOP AND CROSBY, 1936 (in part), pp. 39–40. ROEWER, 1942, pp. 632–633.

Islandiana alata: BRAENDEGAARD, 1937, pp. 12–13, figs. 7, 8, 9a–9b. HOLM, 1945, pp. 5, 21–25, figs. 5a–5d; 1950, pp. 108, ff.; 1960, p. 121. BRAENDEGAARD, 1946, pp. 50–51; 1958, p. 68, fig. 63b. CHAMBERLIN AND IVIE, 1947, p. 45. BONNET, 1957 (in part), p. 2310.

Gonglydiellum flavum HOLM, 1939, pp. 2, 23–25, figs. 11a–11c.

DIAGNOSIS: One of largest known species of *Islandiana*. Closest in structure to *holmi*, from which it differs in details of palpus and epigynum. As



FIGS. 16-21. *Islandiana alata* (Emerton). 16. Left palp, ectal view. 17. Tibia and patella of left palp, dorsal view. 18. Tibia and patella of left palp, mesial view. 19. Epigynum, ventral view. 20. Epigynum, posterior view. 21. Epigynum, lateral view.

FIGS. 22-25. *Islandiana flaveola* (Banks). 22. Left palp, ectal view. 23. Tibia and patella of left palp, dorsal view. 24. Epigynum, ventral view. 25. Epigynum, posterior view.

viewed from above, tibia of palp with distinct process on mesial margin (fig. 17). Median sclerite of epigynum, as viewed from behind, much narrower basally than in *holmi* (fig. 20).

DESCRIPTION: Color usually pale, in some cases tending toward duskiness, especially on sternum and abdomen. Structure generalized, with distinctive features limited to genitalia. Cl elciera of male without fixed

spur in front, but with a tiny setigerous nodule in its place. Fang groove with four teeth in front, three denticles behind. Eyes of female occupying 0.6 width of head. Height of clypeus 2.5 diameters of anterior lateral eye. Posterior median eyes about diameter apart, similar distance from lateral eyes. Anterior median eyes radius apart, nearly diameter from lateral eyes. Eyes of male similar to female, but slightly closer together. Palpus with three enlarged, serrate setae on paracymbium; prominent process on mesial side of tibia as viewed from above (fig. 17). Epigynum extended into conical point; with long, narrow, median sclerite, as seen from posterior view (fig. 20). Length of male, 2.1 mm.; carapace, 1.0 mm. long, 0.75 mm. wide; tibia-patella I, 0.9 mm., IV, 1.05 mm. Length of female, 2.45 mm.; carapace, 1.0 mm. long, 0.75 mm. wide; tibia patella I, 0.85 mm., IV, 1.0 mm.

DISTRIBUTION: Northern Sweden, northern Canada, and Alaska.

TYPE DATA: *Tmeticus alatus* Emerton, male holotype, and two female paratypes from Cockburn Point, Northwest Territories, Canada, September 26, 1914 (F. Johansen), in Canadian National Museum, Ottawa. *Gongylidiellum flavum* Holm, female holotype from Abisko National Park, Nisssonjokk, Lappland, Sweden, July 12, 1930 (K. H. Forsslund), in Zoological Institute, Uppsala.

LOCALITY RECORDS: *Sweden*: Abisko National Park, July, 1943, two males and seven females, Holm (1950), Zoological Institute, Uppsala, and the American Museum of Natural History. *Canada*: Bernard Harbour, Dolphin and Union Strait, Northwest Territories, June 27, 1916 (F. Johanson), four females and one immature male, Emerton (1919), Canadian National Museum, Ottawa. *Alaska*: Admiralty Island, June, 1933 (Sheppard), three males and one female (another female in the same vial proved to be a remarkably similar-appearing *Meioneta*), Bishop and Crosby, 1936, Cornell University. Matanuska, June 24–30, 1945, one male; Matanuska River at Hicks Creek, September 17, 1945, one male; Homer, July 20–25, 1945, one male and three females (J. C. Chamberlin), Chamberlin and Ivie, 1947, University of Utah. Meade River, longitude 157° W., latitude 71° N., August 8–9, 1958 (Carl H. Lindroth), one male and two females, Holm (1960).

Islandiana flaveola (Banks)

Figures 22–25

Tmeticus flaveolus BANKS, 1892, p. 39, pl. 4, fig. 15; 1895, p. 424; 1896, p. 191; 1916, p. 74. BRYANT, 1908, p. 33. EMERTON, 1909, p. 193, figs. 8–8b. BARROWS, 1918, p. 305 [as *Tmeticus* (*Gonglydium*) *flaveolens* Emerton].

Oedothorax flaveolus: CROSBY, 1905, p. 311. PETRUNKEVITCH, 1911, p. 262. CROSBY AND BISHOP, 1928, p. 1050. SMITH, 1928, p. 488.

Gonglydium flaveolus (*sic*): BANKS, 1910, p. 30.

Aduva flaveola: BISHOP AND CROSBY, 1936, p. 40, figs. 4-7. ROEWER, 1942, p. 33.

Islandiana flaveola: BRAENDEGAARD, 1937, p. 18. KASTON, 1948, p. 206, figs. 679-681; 1955, p. 167. BONNET, 1957, p. 2311.

Islandiana longisetosa: RAPP, 1946, p. 318. KASTON, 1955, p. 167.

Tapinocyba iowa CHAMBERLIN, 1948, p. 552, figs. 124-125.

Islandiana sp., aff. *flaveola*: WHITCOMB AND BELL, 1964, p. 43.

DIAGNOSIS: Small species, less than 1.5 mm. in length, related to *flavoides*, new species, and *mimbres*, new species. Size smaller than *flavoides*, but not otherwise distinctive in female; palpus of male showing much difference in thickness of two enlarged setae of paracymbium (fig. 22). Chelicera of male with distinct spur in front, not present in *mimbres*.

DESCRIPTION: Color typical for genus, with tendency toward melanism in some specimens. Structure essentially typical for genus; eyes of usual arrangement; legs of usual proportions. Palpus small; tibia widened dorsoventrally, with conspicuous spur above; paracymbium with two enlarged setae, dorsal one much heavier than other, both less than half of length of cymbium (fig. 22). Epigynum flattened, without structural features on surface; small, double notch at tip; posterior plate large, wider than long (fig. 25). Length of male, 1.3 mm.; carapace, 0.62 mm. long, 0.43 mm. wide; tibia-patella I, 0.58 mm., IV, 0.62 mm. Length of female, 1.4 mm.; carapace, 0.6 mm. long, 0.42 mm. wide; tibia-patella I, 0.55 mm., IV, 0.6 mm.

DISTRIBUTION: Ranges from eastern New England through southern Ontario and northern United States to western Montana and southward into Arkansas and Texas.

TYPE DATA: Male holotype from South Hill, near Ithaca, New York, October, 1889; female allotype from Fall Creek, New York, February, 1889 (Nathan Banks), Museum of Comparative Zoölogy. *Tapinocyba iowa* Chamberlin, female holotype from Washington County, Iowa, 1935 (Floyd Andre), University of Utah.

LOCALITY RECORDS: *Massachusetts*: Coffins Beach, Gloucester, April 20, 1908 (J. H. Emerton), six males, nine females, Emerton (1909). *New Hampshire*: Hanover (Nathan Banks), one male, Bryant (1908). *New York*: Seacliff, Long Island, October (Nathan Banks), one male, one female. All above in Museum of Comparative Zoölogy. Covey Hill Gulf, Clinton County, September 26, 1936, one male; Ithaca, "December" and November 18, 1934, two males; Geneva, November 14, 1914, one male; all collected by C. R. Crosby. Otto, October 25, 1902 (J. H. Comstock), one male, Bishop and Crosby (1936), Cornell University. *Pennsylvania*:

Neshaminy Creek, east of Jamison, various dates from 1954 to 1963 (Wilton Ivie), three males, three females. *Ohio*: Columbus, November 10, 1917 (W. M. Barrows), one male, Barrows (1918), presumably Ohio State University. *Illinois*: Salts, Vermilion County, 1925 to 1926 (V. G. Smith), eight males and three females, Smith (1928), Cornell University and the American Museum of Natural History. Augerville, October 30, 1924 (Rutherford), one male, Bishop and Crosby (1936), Cornell University. Fairmont, June 10, 1952 (R. W. Larimore), one male. White Heath, January 8, 1939 (Jane C. Dirks), one female. Urbana, November, 1938, to April, 1939 (P. C. Stone), four males. Urbana, February 14, 1945, one male and two females; Mahomet, December 31, 1934, one male (J. L. C.

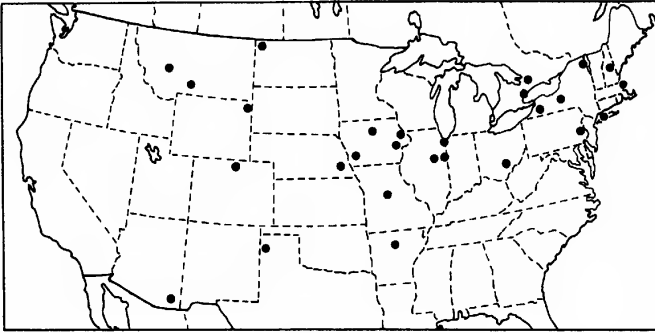


FIG. 26. Map showing distribution of *Islandiana flaveola* (Banks).

and W. F. Rapp), Rapp (1946), *longisetosa*. *Indiana*: Buffington, May 21, 1910, Museum of Comparative Zoölogy. *Iowa*: Ames, Autumn 1932 (H. B. Mills), two males, Bishop and Crosby (1936), Cornell University. Washington County, 1935 (Floyd Andre), one female, Chamberlin (1948), *Tapinocyba iowa*. *Missouri*: Columbia, November, 1904, to May, 1905 (C. R. Crosby), eight males and one female, Bishop and Crosby (1936), Cornell University. *Arkansas*: Morrilton, June 18, 1964, one male, Harriet Exline collection. *Texas*: West of Romero, July 10, 1958 (C. C. Hoff), one male and six females. *Nebraska*: Lincoln, 1941 (M. J. Harbaugh), three males. *North Dakota*: Divide County, 1936–1938 (Joe Davis), one male. *Colorado*: Fort Collins, February (C. F. Baker), one male, Banks (1895), depository unknown. *Wyoming*: Devil's Tower, October 6, 1964 (Jean and Wilton Ivie), one male. *Montana*: Helena, October 3, 1964 (J. and W. Ivie), one male and one female. *Ontario*: Toronto, 1933 (T. B. Kurata), one female. Lake Opeongo, Algonquin Provincial Park, June 26 to July 7, 1945 (T. B. Kurata and W. Ivie), one male.

***Islandiana flavoides*, new species**

Figures 27-29

Islandiana flaveola: BISHOP AND CROSBY, 1936 (in part), p. 41 (locality record from Orient, New York).

DIAGNOSIS: Very close to *flaveola* in color and structure, but size distinctly larger; with significant differences in tibia and paracymbium of male palpus (fig. 27), but no obvious structural differences in the epigynum. Dorsal point on tibia of palpus shorter and blunter than in *flaveola*; two enlarged setae on paracymbium of nearly equal length and thickness. Chelicera of male with conspicuous spur in front, larger than in *flaveola*.

DESCRIPTION: Length of male, 1.50 mm.; carapace, 0.73 mm. long, 0.53 mm. wide; tibia-patella I, 0.70 mm., IV, 0.75 mm. Length of female, 1.8 mm.; carapace, 0.70 mm. long, 0.50 mm. wide; tibia-patella I, 0.64 mm., IV, 0.68 mm.

TYPE DATA: Male holotype from Orient, Long Island, New York, longitude 72° 18' W., latitude 41° 09' N., June 21, 1934 (C. R. Crosby), in Cornell University Collection. Three female paratypes from Orient Beach State Park, New York, May 5, 1955 (Wilton Ivie).

***Islandiana mimbres*, new species**

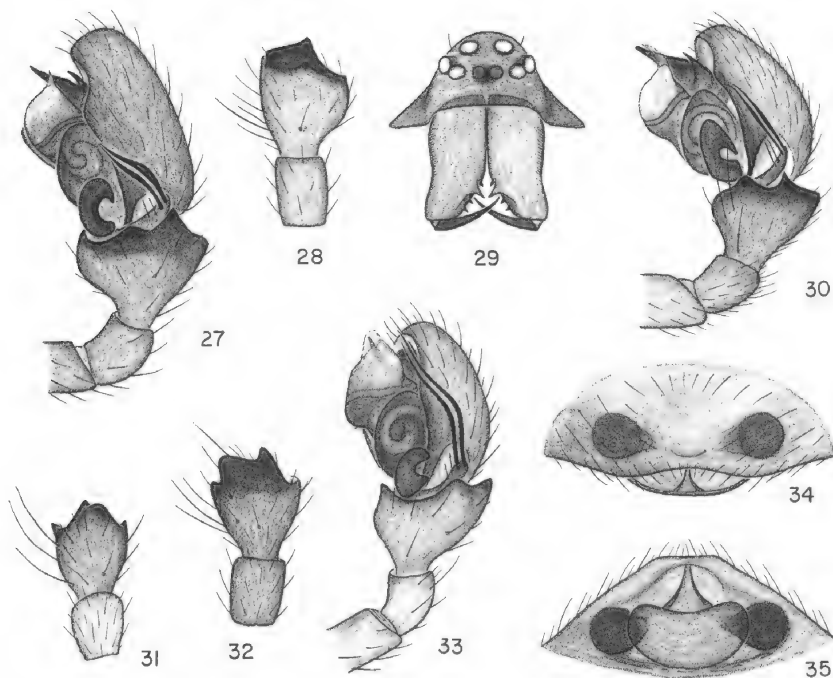
Figures 30, 31

DIAGNOSIS: A small species, closest to *flaveola* in size and structure, but differing in its lack of a distinct spur on the chelicera and in having both enlarged setae on paracymbium similar in size and thickness.

DESCRIPTION OF MALE: Color of carapace pale yellowish; eyes ringed with black. Endites, palpi, and legs pale yellowish, with palpal organs darker. Sternum and labium pale yellowish, shaded with dusky. Abdomen pale gray, unmarked. Spinnerets pale yellow.

Structure essentially typical for genus; size small. Length, 1.3 mm.; carapace, 0.62 mm. long, 0.45 mm. wide; tibia-patella I, 0.6 mm., IV, 0.64 mm. Eyes normal. Width of eye area two-thirds of width of head. Height of clypeus a little more than two diameters of anterior lateral eye. Posterior eye row slightly recurved, median eyes a scant diameter apart, two-thirds of diameter from lateral eyes. Anterior eye row straight, eyes subcontiguous. Chelicerae with small setigerous spur on lower mesial margin in front. Legs moderately long. Palpus moderately short, with tibia and tarsus normally enlarged; paracymbium with two enlarged setae of medium length and about equal size (fig. 31).

TYPE DATA: Male holotype from Rock Creek, Mimbres Mountains,



FIGS. 27-29. *Islandiana flavoides*, new species. 27. Left palp, ectal view. 28. Tibia and patella of left palp, dorsal view. 29. Face of male.

FIGS. 30-31. *Islandiana mimbres*, new species. 30. Left palp, ectal view. 31. Tibia and patella of left palp, dorsal view.

FIGS. 32-35. *Islandiana longisetosa* (Emerton). 32. Tibia and patella of left palp, dorsal view. 33. Left palp, ectal view. 34. Epigynum, ventral view. 35. Epigynum, posterior view.

New Mexico, longitude 107° 47' W., latitude 32° 50' N., September 7, 1941 (Wilton Ivie).

No other specimens are known.

The name is a noun in apposition, taken from the name of the mountains where the species was collected.

Islandiana longisetosa (Emerton)

Figures 32-35

Tmeticus longisetosus EMERTON, 1882, p. 54, pl. 16, figs. 1-1d. BRYANT, 1908, p. 33. EMERTON, 1909, p. 192, pl. 4, fig. 9. BARROWS, 1918, p. 305.

Gongylidium longisetosum: SIMON, 1884, p. 500. BANKS, 1910, p. 30 (*Gongylidium*). EMERTON, 1920, p. 315 (*longisetosus*).

Erigone longisetosa: MARX, 1890, p. 534.

Oedothorax longisetosus: CROSBY, 1905, p. 311. PETRUNKEVITCH, 1911, p. 263.

Oedothorax sp.: SMITH, 1928, p. 488.

Aduva longisetosa: BISHOP AND CROSBY, 1936, p. 41, figs. 8–9. ROEWER, 1942, p. 633.

Islandiana longisetosa: BRAENDEGAARD, 1937, p. 13. KASTON, 1938, p. 180; 1948, p. 205, figs. 673–678. CHAMBERLIN AND IVIE, 1947, p. 45. BONNET, 1957, p. 2311.

DIAGNOSIS: A distinctive species, not closely related to any others. Paracymbium of male palpus with two very long setae (fig. 33). Chelicera of male with large spur in front. Posterior median sclerite of epigynum much wider than long, reniform (fig. 35).

DESCRIPTION: Color usually pale yellowish throughout, but in some cases moderately darkened in usual manner. Structure typical in general aspects, distinctive in certain details of chelicerae, palpus, and epigynum. Size medium for genus. Length of male, 1.50 mm.; carapace, 0.75 mm. long, 0.56 mm. wide; tibia-patella I, 0.71 mm., IV, 0.75 mm. Length of female, 1.80 mm.; carapace, 0.80 mm. long, 0.62 mm. wide; tibia-patella I, 0.80 mm., IV, 0.90 mm.

TYPE DATA: Male holotype from New Haven, Connecticut, Museum of Comparative Zoölogy.

DISTRIBUTION: ACROSS North America, from New England to Alaska.

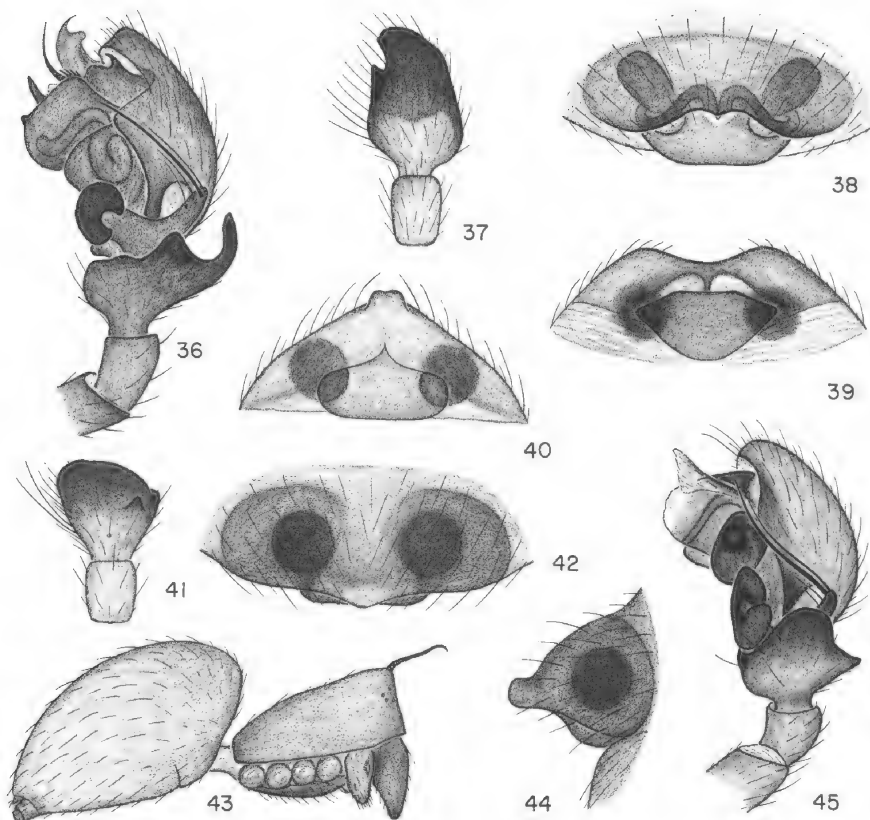
LOCALITY RECORDS: *Massachusetts*: Allston, March 28, 1907 (J. H. Emerton), one male and one female; Holliston, November 4, 1932 (J. H. Emerton and Nathan Banks), two males; Cambridge, April 6, 1942 (C. H. Paige), one male; all in the Museum of Comparative Zoölogy. *Connecticut*: New Haven (type). Sandy Hook, March 13, 1936 (B. J. Kaston), one male. *Pennsylvania*: Neshaminy Creek, east of Jamison, June, 1954 (Wilton Ivie), one male. *Ohio*: Columbus, March 12, 1918 (W. M. Barrows), one male. *Illinois*: Salts, Vermilion County, August 29, 1925, one male; August 11, 1925, one female (both V. G. Smith). *Missouri*: Columbia, November 1904 (C. R. Crosby), one male, Cornell University. *Manitoba*: Dauphin, reported by Emerton, 1920. *Alaska*: Fisher Claim, Grant Creek near Yukon River, August 26 to September 16, 1946 (R. D. Hamilton), one male, University of Utah.

Islandiana lasalana (Chamberlin and Ivie), new combination

Figures 36–39

Oedothorax lasalanus CHAMBERLIN AND IVIE, 1935, p. 18, figs. 46–49. ROEWER, 1942, p. 646. BONNET, 1958, p. 3150.

DIAGNOSIS: Not closely related to any other known species. Distinctive in having only one heavily developed seta on paracymbium of male



FIGS. 36-39. *Islandiana lasalana* (Chamberlin and Ivie). 36. Left palp, ectal view. 37. Tibia and patella of left palp, dorsal view. 38. Epigynum, ventral view. 39. Epigynum, posterior view.

FIGS. 40-45. *Islandiana unicornis*, new species. 40. Epigynum, posterior view. 41. Tibia and patella of left palp, dorsal view. 42. Epigynum, ventral view. 43. Body of male, lateral view. 44. Epigynum, lateral view. 45. Left palp, ectal view.

palpus, although a second slender seta is quite long (fig. 36).

DESCRIPTION: Color of cephalothorax and appendages amber yellow; chelicerae slightly darker and more reddish; sternum and labium covered with dusky. Abdomen light gray to blackish. Structure typical, without special modifications other than details of palp (figs. 36, 37) and epigynum (figs. 38, 39). Chelicera of male lacking fixed spur in front. Eyes typical; posterior eye row slightly recurved. Length of male, 1.63 mm.; carapace, 0.80 mm. long, 0.66 mm. wide; tibia-patella I, 0.75 mm., IV, 0.80 mm. Length of female, 1.80 mm.; carapace, 0.82 mm. long, 0.58 mm. wide; tibia-patella I, 0.79 mm., IV, 0.85 mm.

TYPE DATA: Male holotype and female allotype from La Sal Mountains, Utah, longitude 109° 15' W., latitude 38° 30' N., about 10,000 feet elevation, October 30, 1931 (Wilton Ivie), University of Utah. One male and one female, paratypes, same data.

***Islandiana unicornis*, new species**

Figures 40-45

DIAGNOSIS: Distinguished by its degenerate eyes and large, hornlike seta projecting forward from head of male. Most closely related to *cavealis*, a larger species.

DESCRIPTION: Color of sclerotized parts light amber yellow, with chelicerae slightly darker and more reddish. Abdomen pale yellowish gray, unmarked.

STRUCTURE: Carapace of male somewhat elevated behind eyes, with very large seta projecting forward from anterior apex (fig. 43). Eyes very small, pale, degenerate. Carapace of female unmodified. Chelicera of male without spur in front, only a tiny nodule in its usual place. Fang groove with five teeth on anterior margin, four smaller teeth on posterior margin. Legs relatively long and slender for genus. Palpus of male with two very long setae on paracymbium, ventral one longer and stouter than other (fig. 45). Epigynum a simple, subconical projection (fig. 44); posterior median sclerite much wider than long (fig. 40). Length of male, 1.50 mm.; carapace, 0.75 mm. long, 0.50 mm. wide; tibia-patella I, 0.75 mm., IV, 0.87 mm. Length of female, 1.80 mm.; carapace, 0.80 mm. long, 0.55 mm. wide; tibia-patella I, 0.85 mm., IV, 1.0 mm.

DISTRIBUTION: Northern Texas; known only from caves.

TYPE DATA: Male holotype and three female paratypes from Black Hand Cave, 4 miles east of Newlin, Childress County, Texas, May 1963 (J. Reddell and B. Russell). "All but largest [female] found in darkness."

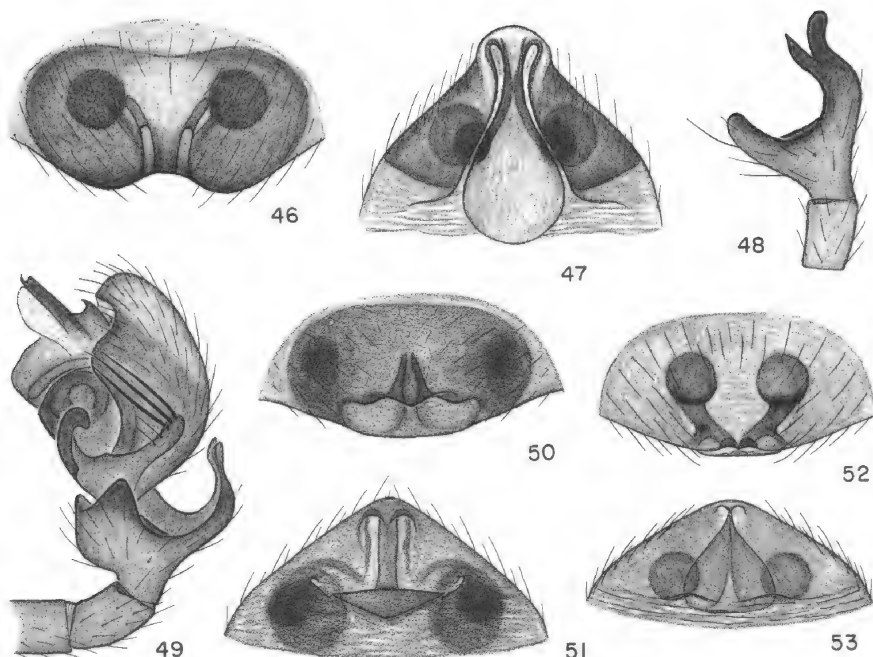
OTHER LOCALITY: *Texas*: Big Mouth Cave, 2 miles north of Shamrock, May, 1963 (J. Reddell and B. Russell), one female.

***Islandiana cavealis*, new species**

Figures 50, 51

DIAGNOSIS: Blind, cave-dwelling species of moderately large size, with legs longer than usual for genus. Epigynum distinctive in details but of general *Islandiana* form (figs. 50, 51). Related to *unicornis* but differing from it in larger size and details of epigynum.

DESCRIPTION OF FEMALE: Cephalothorax, appendages, spinnerets, and



FIGS. 46-49. *Islandiana muma*, new species. 46. Epigynum, ventral view. 47. Epigynum, posterior view. 48. Tibia and patella of left palpus, ectodorsal view. 49. Left palpus, ectal view.

FIGS. 50, 51. *Islandiana cavealis*, new species. 50. Epigynum, ventral view. 51. Epigynum, posterior view.

FIGS. 52, 53. *Islandiana speophila*, new species. 52. Epigynum, ventral view. 53. Epigynum, posterior view.

epigynum light amber, with chelicerae darker and more reddish. Abdomen pale yellowish gray, unmarked. Eyes present but very degenerate. Chelicerae stout; stridulating file weak; fang groove with five or six stout teeth on anterior margin, five small teeth on posterior margin. Legs moderately long; spination typical. Epigynum protruding as blunt cone; posterior sclerite narrow and depressed for most of length, broadly triangular proximally (fig. 51). Length, 2.5 mm.; carapace, 1.0 mm. long, 0.75 mm. wide; tibia-patella I, 1.3 mm., IV, 1.4 mm.

DISTRIBUTION: Kentucky, in caves.

TYPE DATA: Female holotype from Picadome Cave, 1.5 miles west-southwest of Lexington, Kentucky, July 1, 1957 (C. Kreckeler and J. Rittmann).

OTHER LOCALITY: *Kentucky*: Scott Cave, January 18, 1963 (T. C. Barr), two females.

***Islandiana speophila*, new species**

Figures 52, 53

DIAGNOSIS: A small pallid species of cave habitat, somewhat resembling *flaveola*, differing in female from that species by nearly complete absence of eyes, longer legs, paler color, and details of epigynum.

DESCRIPTION: Color very pale; cephalothorax and appendages light yellowish, abdomen whitish.

Structure more slender than usual for genus, legs longer. Eyes nearly absent, without pigmentation. Chelicerae moderately slender, with five teeth on anterior margin of fang groove, four tiny teeth on posterior margin. Legs long and slender. Epigynum only moderately protruding; openings beneath tip, close together; spermathecae showing through integument very clearly (fig. 52); posterior median sclerite nearly as wide as long, broadly rounded proximally, narrowing to point distally (fig. 53). Length of female, 1.60 mm.; carapace, 0.7 mm. long, 0.55 mm. wide; tibia-patella I, 0.95 mm., 1.05 mm.

TYPE DATA: Female holotype from Trout Cave, Pendleton County, West Virginia, March 4, 1961 (Lyle G. Conrad).

***Islandiana muma*, new species**

Figures 46-49

DIAGNOSIS: Small, cave-dwelling species, 1.5 mm. or less in body length; blind, eyes virtually absent; legs long; palpus and epigynum distinctive. Not closely related to other known species.

DESCRIPTION: Color of cephalothorax and appendages light amber yellow; abdomen whitish, unmarked.

STRUCTURE: Carapace low, similar in both sexes. Eyes almost absent, with a pair of tiny black dots marking former location of anterior median eyes and tiny clear convexities marking location of other eyes. Legs elongated. Palpus of male with large, curved, terminally bifurcate projection on dorsal side of tibia; paracymbium with three large setae of medium length and nearly equal size (fig. 49). Epigynum projecting as a rounded cone; openings exposed on ventral surface; posterior median sclerite longer than wide, narrow distally, widened and rounded proximally (fig. 47).

Length of male, 1.4 mm.; carapace, 0.7 mm. long, 0.52 mm. wide; tibia-patella I, 0.85 mm., IV, 1.0 mm. Length of female, 1.5 mm.; carapace, 0.7 mm. long, 0.52 mm. wide; tibia-patella I, 0.9 mm., IV, 1.05 mm.

TYPE DATA: Male holotype from Buck Hill Cave, Natural Bridge, Virginia, October 30, 1941 (Martin H. Muma); two females, same locality, November 4, 1944, June 5, 1943 (Martin H. Muma).

OTHER LOCALITY: Wolf Den Cave, Colbert County, Alabama, September 25, 1940 (Jones and Archer), one female.

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